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## Bibliography

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(54) [Title of the Invention] Horizontal array receipt mold automatic vending machine  
(51) [International Patent Classification (6th Edition)]

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[FI]

G07F 11/60

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[Identification Number] 000001052

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Epitome

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(57) [Abstract]

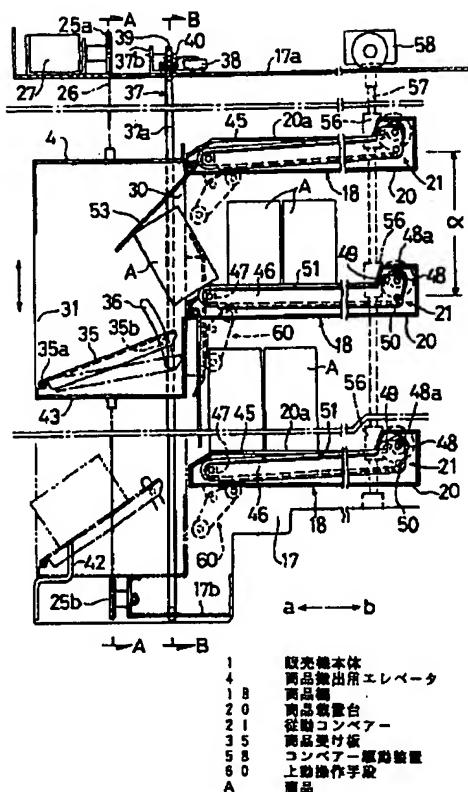
[Technical problem] Structure be easy and attain a miniaturization.

[Means for Solution] While two or more shelf spaces 18 which contain Goods A in the state of a horizontal array are arranged in the level condition along the vertical direction in the body 1 of a vending machine at every predetermined interval alpha, This each shelf space 18 is countered and the elevator 4 for goods taking out is formed possible [rise and fall]. Each shelf space 18 It has the goods installation base 20 and the follower conveyor 21 arranged possible [vertical movement in this goods installation base 20]. This follower conveyor 21 Project more nearly up than top-face 20a of the goods installation base 20, and it is constituted so that Goods A may be received from the goods installation base 20. The conveyor driving gear 58 which drives the follower conveyor 21 of each shelf space 18 is formed, and the upper \*\*\*\*\* means 60 made to upper-\*\* the follower conveyor 21 which counters this elevator 4 between each shelf space 18 and an elevator 4 is established.

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CLAIMS

[Claim(s)]

[Claim 1] The horizontal array receipt mold automatic vending machine characterized by providing the following It is the goods installation base on which this each shelf space is countered, the elevator for goods taking out is formed possible [ rise and fall ] in the body of a vending machine while the shelf space which contains goods in the state of a horizontal array is arranged in the two or more step level condition along the vertical direction, and said each

shelf space puts the goods of a horizontal array condition. It has the follower conveyor arranged possible [ vertical movement in this goods installation base ]. This follower conveyor By upper-\*\*(ing), project more nearly up than the top face of a goods installation base, and it is constituted so that goods may be received from a goods installation base. The upper \*\*\*\*\* means which the conveyor driving gear which drives the follower conveyor of each shelf space is prepared for the proper place within the body of a vending machine, and is made to upper-\*\* the follower conveyor which counters this elevator between said each shelf space and said elevators

[Claim 2] Said elevator is the horizontal array receipt mold automatic vending machine according to claim 1 characterized by to connect with the cord object for a drive wound around the drive body of revolution pivoted in the upper part and the lower part within the body of a vending machine, respectively, and follower body of revolution, to prepare two or more detected members in this cord object corresponding to spacing between each of said shelf space, and to form the detector for elevator location detection which counters said cord object and detects each \*\*\*\*\* member.

[Claim 3] The horizontal array receipt mold automatic vending machine according to claim 1 or 2 characterized by arranging a goods backing plate possible [ vertical movement ] in said elevator, preparing the rocking member which is interlocked with that this goods backing plate receives goods and is lower-\*\*(ed), and is rocked, and forming the detector for goods detection which detects rocking of this rocking member.

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#### DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the horizontal array receipt mold automatic

vending machine which contains goods in the state of a horizontal array to two or more shelf spaces within the body of a vending machine.

[0002]

[Description of the Prior Art] Conventionally, the shelf space which contains goods in the state of a horizontal array is arranged in the two or more step level condition along the vertical direction, the drive conveyor is formed in the body of a vending machine, at this each shelf space as an example of this kind of horizontal array receipt mold automatic vending machine, and there are some which desired goods are dropped and are paid out of this shelf space by making it run the drive conveyor of the shelf space which contains desired goods.

[0003]

[Problem(s) to be Solved by the Invention] It is necessary to form the motor for driving a drive conveyor in each shelf space, and with the above-mentioned conventional configuration, since there are many the motors, structure is complicated, it enlarges and a manufacturing cost costs dearly. Moreover, in order to drop goods and to pay out of each shelf space, while the noise occurs in the case of the expenditure, there is a possibility that goods may deform or it may be damaged.

[0004] This invention can make a manufacturing cost cheap, and moreover, the noise does not occur in the case of expenditure of goods, but it aims at offering the horizontal array receipt mold automatic vending machine which goods deformed or was made not to damage while structure is easy and can attain a miniaturization in view of the above-mentioned trouble.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 While the shelf space which contains goods in the state of a horizontal array is arranged in the two or more step level condition along the vertical direction in the body of a vending machine This each shelf space is countered and the elevator for goods taking out is formed possible [ rise and fall ]. Said each shelf space It has the goods installation base which carries the goods of a horizontal array condition, and the follower conveyor arranged possible [ vertical movement in this goods installation base ]. This follower conveyor By upper-\*\*(ing), project more nearly up than the top face of a goods installation base, and it is constituted so that goods may be received from a goods installation base. It is characterized by preparing the proper place within the body of a vending machine the conveyor driving gear which drives the follower conveyor of each shelf space, and establishing the upper \*\*\*\*\* means made to upper-\*\* the follower conveyor which counters this elevator between said each shelf space and said elevators.

[0006] If the push button formed in the front face of an automatic vending machine is pushed in the above-mentioned configuration and desired goods are specified Make it go up and down an elevator based on the assignment signal, and the location which counters the follower

conveyor which carried the goods of a request of the elevator is stopped. By a follower conveyor's being upper-\*\*(ed) with an upper \*\*\*\*\* means by it and coincidence, and making this follower conveyor project more nearly up than the top face of a goods installation base The goods on a goods installation base are received by the follower conveyor, the follower conveyor drives with a conveyor driving gear, the goods of the request on this follower conveyor are taken out in an elevator, after that, said elevator is dropped and desired goods are paid out.

[0007] In this case, the conveyor driving gear which drives the follower conveyor of each shelf space is prepared for the proper place within the body of a vending machine, and a manufacturing cost can be made cheap, while structure is easy and can attain a miniaturization, since it is not necessary to form the driving gear for driving a follower conveyor to each shelf space. Moreover, since this elevator is dropped and desired goods are paid out after moving the goods of the request on a follower conveyor to an elevator and changing them, the noise does not occur in the case of the expenditure, and goods deform or it is not damaged.

[0008] Invention according to claim 2 is set to invention according to claim 1. Said elevator It connects with the cord object for a drive wound around the drive body of revolution pivoted in the upper part and the lower part within the body of a vending machine, respectively, and follower body of revolution. It is characterized by preparing two or more detected members in this cord object corresponding to spacing between said each shelf space, and forming the detector for elevator location detection which counters said cord object and detects each \*\*\*\*\* member.

[0009] In the above-mentioned configuration, by making it run the cord object for a drive, when you make it go up and down an elevator and this detects in a detector two or more detected members prepared in said cord object, the location of an elevator can be detected and the location which counters the follower conveyor which carried the goods of a request of the elevator can be stopped correctly.

[0010] In this case, the location of an elevator is detectable in one detector, and compared with the case where an elevator detector is formed in each shelf space, structure is easy and can make a manufacturing cost cheap.

[0011] Invention according to claim 3 is characterized by arranging a goods backing plate possible [ vertical movement ] in said elevator, preparing the rocking member which is interlocked with that this goods backing plate receives goods and is lower-\*\*(ed), and is rocked in invention according to claim 1 or 2, and forming the detector for goods detection which detects rocking of this rocking member.

[0012] In the above-mentioned configuration, if desired goods are taken out in an elevator, it is detectable that goods were taken out in the elevator by the goods' being received by the goods

backing plate, lower-\*\*(ing) this goods backing plate, and detecting rocking of the rocking member interlocked with it in the detector for goods detection.

[0013] In this case, even if the elevator has stopped in which height location, it is detectable that goods were taken out in the elevator in one detector, and structure is easy and can make a manufacturing cost cheap.

[0014]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. Drawing 7 is prepared in the before side space 3 in this shelf space unit 2 possible [ rise and fall of the elevator 4 for goods taking out ] while the horizontal array receipt mold automatic vending machine which is one gestalt of operation of this invention is shown and the shelf space unit 2 is formed in the body 1 of a vending machine. In addition, goods expenditure opening with the closing motion door 9 which established 7 at the inner door 8, the goods output port with the closing motion door 12 which established 10 at the outside door 11, and 14 are the units outside a warehouse, and have compressor 14a and capacitor 14b.

[0015] The frame 17 by which lifting and holding were carried out to the guide rail 16 prepared in the head-lining section of the body 1 of a vending machine movable at cross directions a and b as said shelf space unit 2 was shown in drawing 7 , As it has two or more shelf spaces 18 arranged in the level condition along the vertical direction at every regular intervals alpha in this frame 17 and an imaginary line shows to drawing 7 The shelf space unit 2 can be pulled out in the direction of arrow-head a, Goods A can be contained in the state of a horizontal array to each shelf space 18, and this each shelf space 18 has the goods installation base 20 which carries the goods A of a horizontal array condition, and the follower conveyor 21 arranged possible [ vertical movement in this goods installation base 20 ]. In addition, spacing between each shelf space 18 may be changed according to the magnitude of Goods A.

[0016] Said elevator 4 consists of a rectangle box which formed the inlet port 30 and the outlet 31 in the order wall, as shown in drawing 1 and drawing 2 . It connects with the chain 26 for a drive (cord object) wound around drive sprocket-wheel (drive body of revolution) 25a and follower sprocket-wheel (follower body of revolution) 25b which were pivoted in top-plate section 17a of a frame 17, and bottom plate section 17b, respectively. You can make it go up and down said elevator 4 by carrying out the rotation drive of the drive sprocket-wheel 25a with the driving gear 27 for rise and fall which consists of a geared motor.

[0017] As shown in drawing 1 - drawing 3 , corresponding to the spacing alpha of each shelf space 18, two or more detected members 32 are formed in said chain 26 for a drive, and the detector 33 for elevator location detection which consists of a microswitch which counters on top-plate section 17a at a chain 26, and detects the detected member 32 is formed in it.

[0018] In the above-mentioned configuration, when you make it run a chain 26, you make it go up and down an elevator 4 and this detects two or more detected members 32 prepared in the

chain 26 in a detector 33, the location of an elevator 4 can be detected and the location which counters the shelf space 18 which carried the goods A of a request of the elevator 4 can be stopped correctly.

[0019] In this case, since the location of an elevator 4 is detectable in one detector 33, compared with the case where an elevator detector is formed in each shelf space 18, structure is easy and can make a manufacturing cost cheap.

[0020] As shown in drawing 1 and drawing 2, the goods backing plate 35 is arranged by the lower part in an elevator 4. This goods backing plate 35 When pivot 35a which protruded on the end section is supported pivotably by the side attachment wall of the elevator 4 near the outlet 31 It is constituted possible [ vertical movement ] focusing on this pivot 35a, and height 35b which protruded on the other end of the goods backing plate 35 penetrates the circular long hole 36 formed in the side attachment wall of an elevator 4, and is projected outside the elevator 4.

[0021] As shown in drawing 3 - drawing 5, the detector 38 for goods detection which consists of a rocking member 37 and a microswitch corresponding to said height 35b is formed. Said rocking member 37 has rocking rod 37a and swinging arm 37b, and this rocking rod 37a is contacted by said height 35b, and when the lower limit section of the letter of the abbreviation for L characters is supported pivotably by bottom plate section 17b, it is constituted rockable focusing on this lower limit section. The point is connected with the upper limit section of rocking rod 37a while said swinging arm 37b is supported pivotably by top-plate section 17a rockable focusing on the lower limit section of rocking rod 37a, and the said alignment-like pivot 39. Said detector 38 counters the end face section of swinging arm 37b, and is being fixed on top-plate section 17a. Moreover, the spring 40 which energizes swinging arm 37b to said pivot 39 in an one direction is formed, rocking rod 37a is forced on said height 35b by the energization force of the spring 40, and said goods backing plate 35 is pushed up.

[0022] In the above-mentioned configuration, in the condition of having not taken out the desired goods A in an elevator 4 the goods backing plate 35 upper-\*\* and it holds in the state of an inclination -- having (referring to drawing 1 continuous line) -- If the end face section of swinging arm 37b is contacted by the detector 38 and the desired goods A are taken out in an elevator 4 from [refer to drawing 5 (b)] and this condition, on the goods backing plate 35, these goods A will appear and will be received. By this this goods backing plate 35 resists a spring 40, and lower-\*\* -- having (referring to drawing 1 alternate long and short dash line) -- It is detectable that swinging arm 37b was rocked through height 35b and rocking rod 37a, it was estranged from the detector 38, and [referring to drawing 5 (c)] and Goods A were taken out in the elevator 4.

[0023] In this case, even if the elevator 4 has stopped in which height location, it is detectable that Goods A were taken out in the elevator 4 in one detector 38, and structure is easy and can

make a manufacturing cost cheap.

[0024] 42 are the goods expenditure frame which protruded on bottom plate section 17b, and by maximum-dropping an elevator 4, by applying the upper limit section of this expenditure frame 42 to the goods backing plate 35 through the through tube 43 installed through the bottom wall of an elevator 4, this goods backing plate 35 is pushed up, and they pay out the goods A on the goods backing plate 35 outside an elevator 4 among drawing 1 (refer to drawing 1 two-dot chain line).

[0025] As said goods installation base 20 is shown in drawing 1 and drawing 4, it is formed in abbreviation rectangle box-like, and along with a longitudinal direction, predetermined spacing is set to the top-face 20a, and two or more long holes 45 are established in parallel.

[0026] The pulleys 47 and 48 of a pair before and after said follower conveyor 21 was supported pivotably by these cross-section abbreviation KO character-like housing 46 and housing 46 order both ends pivotable, The guide idlers 49 and 50 of the pair which approached the backside pulley 48 and was prepared, When it has two or more belts 51 which countered said each long hole 45 and were wound around said both pulleys 47 and 48 through these both guide idlers 49 and 50 and pivot 48a of said backside pulley 48 is supported pivotably by the goods installation base 20 It is constituted possible [ vertical movement ] focusing on the pivot 48a, and through the long hole 45, each belt 51 projects more nearly up than top-face 20a of the goods installation base 20, and when it upper-\*\*, it is constituted so that the goods A of the goods installation base 20 may be received.

[0027] As shown in drawing 1 and drawing 6, while a worm gear 55 fixes to pivot 48a of the backside [ each follower conveyor 21 ] pulley 48 The worm gearing 56 which gets into gear to this each worm gear 55 is really connected with the connection rod 57. It connects with the driving shaft of the conveyor driving gear 58 which consists of a GYADO motor which the upper limit section of this connection rod 57 formed in top-plate section 17a. Each follower conveyor 21 can be driven through the connection rod 57, a worm gearing 56, and a worm gear 55 with the conveyor driving gear 58.

[0028] As shown in drawing 4 and drawing 6, an upper \*\*\*\*\* means 60 to make the follower conveyor 21 which counters this elevator 4 upper-\*\* is established between each shelf space 18 and an elevator 4. The rocking plate 62 with which the center section was supported pivotably rockable by the pivot 61 to which this protruded on the goods installation base 20 of each shelf space 18, The top guide idler 64 contacted by the piece 63 of engagement which was pivoted in the upper limit of this rocking plate 62, and protruded on the housing 46 of the follower conveyor 21, While becoming the actuation plate 66 which fixed to height 4a which counters the bottom guide idler 65 pivoted in the lower limit of a rocking plate, and this bottom guide idler 65, and is prolonged in back from the side attachment wall of an elevator 4 clutteringly and prolonging the actuation plate 66 in the vertical direction Moreover, lower limit

section 66a inclines in the elevator 4 side.

[0029] In the above-mentioned configuration, as shown in drawing 6 (a), the follower conveyor 21 lower-\*\*, the rocking plate 62 is depressed through the top guide rail 64 by the piece 63 of engagement, and the bottom guide idler 65 in the condition of having projected ahead, by this If an elevator 4 is dropped, as shown in this drawing (b), the bottom guide idler 65 will be back extruded with the actuation plate 66. By this The rocking plate 62 rotates upward, make the follower conveyor 21 upper-\*\* through the piece 63 of engagement by the top guide idler 64, a belt 51 is made to project more nearly up than top-face 20a of the goods installation base 20, and the goods A of the goods installation base 20 are received.

[0030] In this case, a manufacturing cost can be made cheap, while structure is easy and can attain a miniaturization, since it is not necessary to form a driving gear for the follower conveyor 21 of each shelf space 18 to drive with one conveyor driving gear 58, and drive the follower conveyor 21 to this each shelf space 18.

[0031] In addition, 53 are the gate established in the front end of each shelf space 18 possible [ closing motion ] among drawing 1 , and it is desirable that prepare a lock device (not shown) in this gate 45, and that lock is canceled at the time of expenditure of Goods A. By this, Goods A can prevent falling from a shelf space 18 to a contingency.

[0032] If said automatic vending machine is controlled by the control unit (not shown) which consists of a microcomputer and an operation of the control unit is explained, in the condition before paying out Goods A, first As a two-dot chain line shows to drawing 7 , the elevator 4 is standing by in the upper part of the before side space 3. In this condition If the push button formed in the front face of an automatic vending machine is pushed and desired goods are specified, based on the assignment signal, will drive the driving gear 27 for rise and fall, and an elevator 4 will be dropped. By detecting two or more detected members 32 prepared in the chain 26 in a detector 33, the location of an elevator 4 is detected and the location which counters the follower conveyor 21 which carried the goods A of a request of an elevator 4 based on the detection signal is stopped (refer to drawing 7 continuous line). by the follower conveyor's 21 being upper-\*\* (ed) by it, simultaneously the upper \*\*\*\*\* means 60, and making this follower conveyor 21 project more nearly up than top-face 20a of the goods installation base 20 The goods A on the goods installation base 20 are received by the follower conveyor 21, the follower conveyor 21 drives with the conveyor driving gear 58, the goods A of the request on this follower conveyor 21 are taken out in an elevator 4, and Goods A are carried on the goods backing plate 35. While detecting that the goods backing plate 35 was lower-\*\* (ed), swinging arm 37b was rocked through height 35b and rocking rod 37a by this, it was estranged from the detector 38, and [referring to drawing 5 (c)] and Goods A were taken out in the elevator 4 and stopping the drive of the conveyor driving gear 58 based on the detection signal, the driving gear 27 for rise and fall is driven, and an elevator 4 is maximum-dropped.

Thereby, the goods backing plate 35 pays out, it is pushed up in the upper limit section of a frame 42 (refer to drawing 1 two-dot chain line), and the goods A on this goods backing plate 35 pay out goods output port 10 through the goods expenditure opening 7.

[0033] In this case, since an elevator 4 is dropped, the desired goods A are paid out and Goods A are not dropped from a shelf space 18 like before, the noise does not occur in the case of that expenditure, and Goods A deform or it is not damaged.

[0034] In addition, although the chain 26 for a drive was used with the above-mentioned configuration in order to make it go up and down an elevator 4, it may replace with it and a wire may be used.

[0035]

[Effect of the Invention] According to invention according to claim 1, the conveyor driving gear which drives the follower conveyor of each shelf space is prepared for the proper place within the body of a vending machine, and a manufacturing cost can be made cheap, while structure is easy and can attain a miniaturization, since it is not necessary to form the driving gear for driving a follower conveyor to each shelf space. Moreover, since this elevator is dropped and desired goods are paid out after moving the goods of the request on a follower conveyor to an elevator and changing them, the noise does not occur in the case of the expenditure, and goods deform or it is not damaged.

[0036] According to invention according to claim 2, the location of an elevator is detectable in one detector, and compared with the case where an elevator detector is formed in each shelf space, structure is easy and can make a manufacturing cost cheap.

[0037] According to invention according to claim 3, even if the elevator has stopped in which height location, it is detectable that goods were taken out in the elevator in one detector, and structure is easy and can make a manufacturing cost cheap.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is drawing of longitudinal section of the important section of the horizontal array receipt mold automatic vending machine which is one gestalt of operation of this invention.

[Drawing 2] It is the A-A view Fig. of drawing 1 .

[Drawing 3] It is this top view.

[Drawing 4] It is this horizontal sectional view.

[Drawing 5] (a) is [ the top view before actuation of this important section and (c of the B-B view Fig. of drawing 1 and (b)) ] the top views after actuation of this important section.

[Drawing 6] (a) And (b) is the front view of an important section showing the procedure made to upper-\*\* a follower conveyor.

[Drawing 7] It is drawing of longitudinal section of this whole automatic vending machine.

### [Description of Notations]

1 Body of Vending Machine

4 Elevator for Goods Taking Out

18 Shelf Space

20 Goods Installation Base

21 Follower Conveyor

25a Drive sprocket wheel (drive body of revolution)

25b Follower sprocket wheel (follower body of revolution)

26 Chain for Drive (Cord Object for Drive)

32 Detected Member

33 Detector for Elevator Location Detection

35 Goods Backing Plate

37 Rocking Member

38 Detector for Goods Detection

58 Conveyor Driving Gear

60 Upper \*\*\*\*\* Means

A Goods

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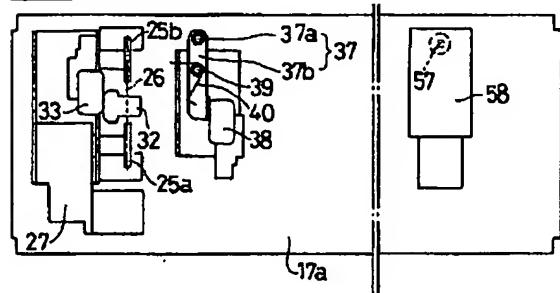
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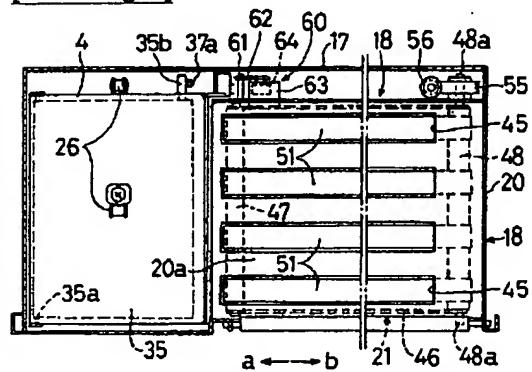
## DRAWINGS

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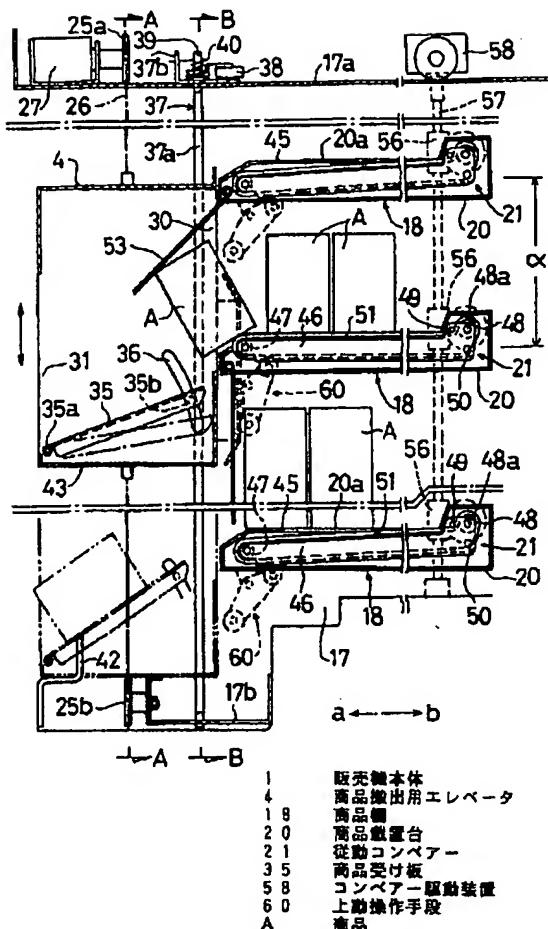
[Drawing 3]



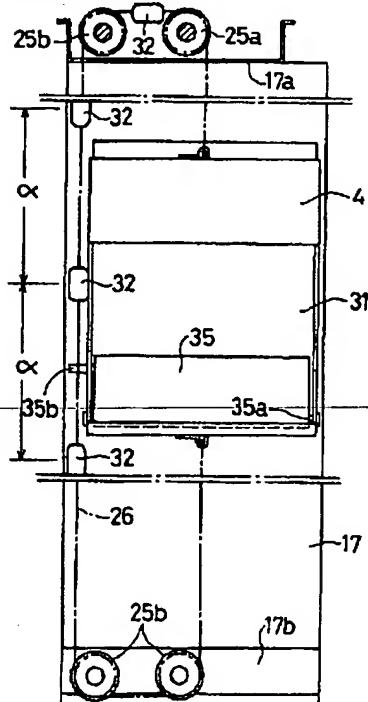
[Drawing 4]



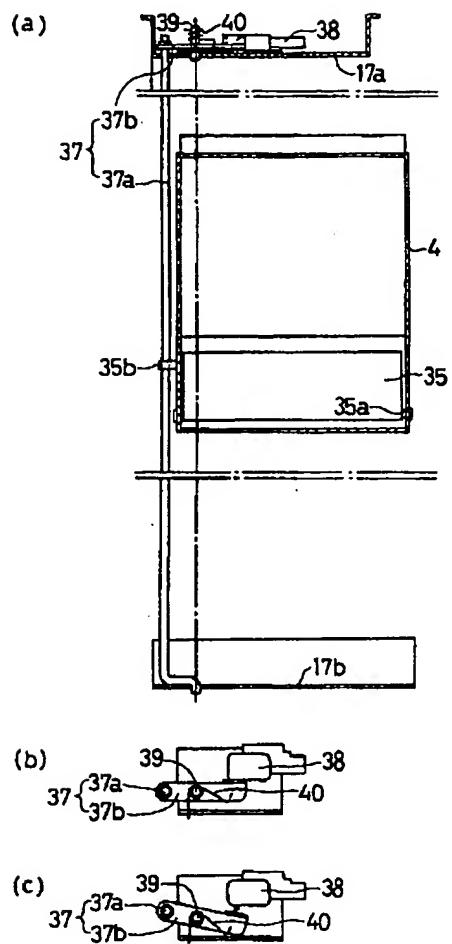
[Drawing 1]



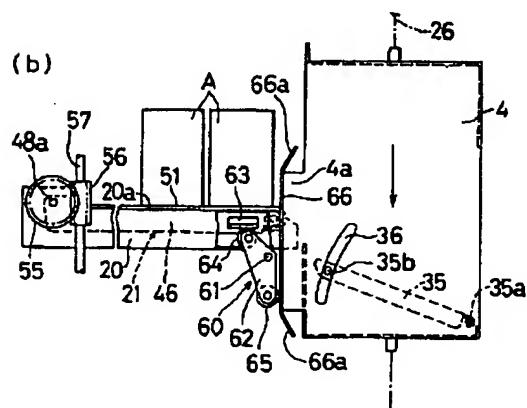
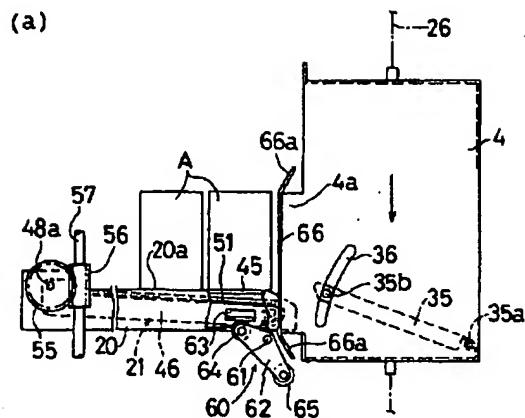
[Drawing 2]



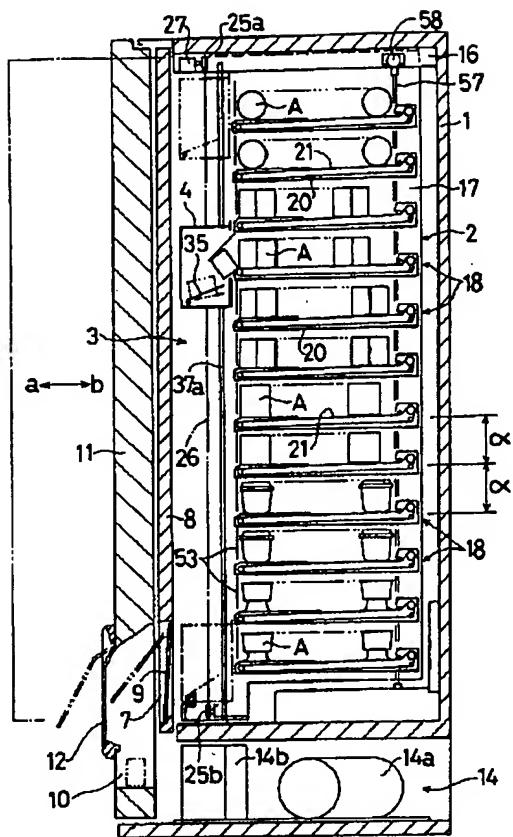
[Drawing 5]



[Drawing 6]



### [Drawing 7]



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(12) 公開特許公報 (A)

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特開平9-259344

(43) 公開日 平成9年(1997)10月3日

(51) Int.Cl.<sup>6</sup>

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厅内整理番号

F I

G 07 F 11/60

## 技術表示箇所

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(22)出願日 平成8年(1996)3月21日

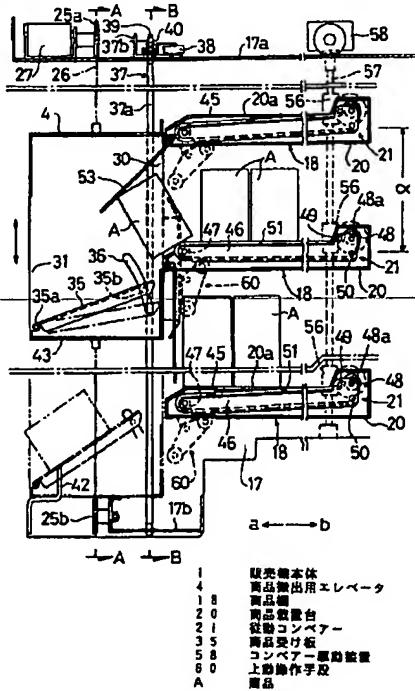
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(74) 代理人 弁理士 森本 義弘

(54) 【発明の名称】 横配列収納型自動販売機

(57) 【要約】

【課題】 構造が簡単で小型化を図ること。

【解決手段】 売機本体1内に、商品Aを横配列状態で収納する複数の商品棚18が上下方向に沿って所定間隔 $\alpha$ ごとに水平状態で配置されると共に、該各商品棚18に対向して商品搬出用エレベータ4が昇降可能に設けられており、各商品棚18は、商品載置台20と、該商品載置台20内に上下動可能に配置された従動コンベア-21とを有し、該従動コンベア-21は、商品載置台20の上面20aよりも上方に突出して、商品載置台20から商品Aを受け取るように構成され、各商品棚18の従動コンベア-21を駆動するコンベア-駆動装置58が設けられ、各商品棚18とエレベータ4との間に、該エレベータ4に対向する従動コンベア-21を上動させる上動操作手段60が設けられている。



## 【特許請求の範囲】

【請求項1】 販売機本体内に、商品を横配列状態で収納する商品棚が上下方向に沿って複数段水平状態で配置されると共に、該各商品棚に対向して商品搬出用エレベータが昇降可能に設けられており、前記各商品棚は、横配列状態の商品を載せる商品載置台と、該商品載置台内に上下動可能に配置された従動コンベアーとを有し、該従動コンベアーは、上動することにより、商品載置台の上面よりも上方に突出して、商品載置台から商品を受け取るように構成され、販売機本体内の適所に各商品棚の従動コンベアーを駆動するコンベアー駆動装置が設けられ、前記各商品棚と前記エレベータとの間に、該エレベータに対向する従動コンベアーを上動させる上動操作手段が設けられていることを特徴とする横配列収納型自動販売機。

【請求項2】 前記エレベータは、販売機本体内の上部及び下部にそれぞれ枢着した駆動回転体と従動回転体とに巻回した駆動用索体に連結され、該索体に前記各商品棚間の間隔に対応して複数の被検知部材が設けられ、前記索体に対向して各被検知部材を検知するエレベータ位置検知用検知器が設けられていることを特徴とする請求項1記載の横配列収納型自動販売機。

【請求項3】 前記エレベータ内に商品受け板が上下動可能に配設され、該商品受け板が商品を受け取って下動されるのに連動して揺動する揺動部材が設けられ、該揺動部材の揺動を検知する商品検知用検知器が設けられていることを特徴とする請求項1または2記載の横配列収納型自動販売機。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、販売機本体内の複数の商品棚に商品を横配列状態で収納する横配列収納型自動販売機に関する。

## 【0002】

【従来の技術】従来、この種の横配列収納型自動販売機の一例として、販売機本体内に商品を横配列状態で収納する商品棚が上下方向に沿って複数段水平状態で配置され、該各商品棚に駆動コンベアーが設けられており、所望の商品を収納する商品棚の駆動コンベアーを走行させることにより、該商品棚から所望の商品を落下させて払出すものがある。

## 【0003】

【発明が解決しようとする課題】上記従来の構成では、各商品棚に駆動コンベアーを駆動するためのモータを設ける必要があり、そのモータの数が多いため、構造が複雑で大型化し、製作費が高くつく。また、各商品棚から商品を落下させて払出すようになっているため、その払出しの際に騒音が発生すると共に、商品が変形したり損傷されたりする虞れがある。

## 【0004】 本発明は、上記問題点に鑑み、構造が簡単

で小型化を図ることができると共に、製作費を安くすることができ、しかも、商品の払出しの際に騒音が発生せず、商品が変形したり損傷されないようにした横配列収納型自動販売機を提供することを目的としている。

## 【0005】

【課題を解決するための手段】上記目的を達成するため、請求項1記載の発明は、販売機本体内に、商品を横配列状態で収納する商品棚が上下方向に沿って複数段水平状態で配置されると共に、該各商品棚に対向して商品搬出用エレベータが昇降可能に設けられており、前記各商品棚は、横配列状態の商品を載せる商品載置台と、該商品載置台内に上下動可能に配置された従動コンベアーとを有し、該従動コンベアーは、上動することにより、商品載置台の上面よりも上方に突出して、商品載置台から商品を受け取るように構成され、販売機本体内の適所に各商品棚の従動コンベアーを駆動するコンベアー駆動装置が設けられ、前記各商品棚と前記エレベータとの間に、該エレベータに対向する従動コンベアーを上動させる上動操作手段が設けられていることを特徴としている。

【0006】上記構成において、自動販売機の前面に設けた押釦を押して所望の商品を指定すると、その指定信号に基づいてエレベータを昇降させ、そのエレベータを所望の商品を載せた従動コンベアーに対向する位置に停止させ、それと同時に、上動操作手段により従動コンベアーが上動されて、該従動コンベアーを商品載置台の上面よりも上方に突出させることにより、商品載置台上の商品が従動コンベアーに受け取られ、その従動コンベアーがコンベアー駆動装置により駆動されて、該従動コンベアー上の所望の商品がエレベータ内に搬出され、その後、前記エレベータを下降させて所望の商品を払出すようになっている。

【0007】この場合、販売機本体内の適所に各商品棚の従動コンベアーを駆動するコンベアー駆動装置が設けられており、各商品棚に従動コンベアーを駆動するための駆動装置を設ける必要がないから、構造が簡単で小型化を図ができると共に、製作費を安くすることができる。また、従動コンベアー上の所望の商品をエレベータに移し換えた後、該エレベータを下降させて所望の商品を払出すようになっているから、その払出しの際に騒音が発生せず、商品が変形したり損傷されたりすることもない。

【0008】請求項2記載の発明は、請求項1記載の発明において、前記エレベータが、販売機本体内の上部及び下部にそれぞれ枢着した駆動回転体と従動回転体とに巻回した駆動用索体に連結され、該索体に前記各商品棚間の間隔に対応して複数の被検知部材が設けられ、前記索体に対向して各被検知部材を検知するエレベータ位置検知用検知器が設けられていることを特徴としている。

## 【0009】上記構成において、駆動用索体を走行させ

ることにより、エレベータを昇降させ、これにより、前記索体に設けた複数の被検知部材を検知器で検知することにより、エレベータの位置を検知し、そのエレベータを所望の商品を載せた従動コンベアーに対向する位置に正確に停止させることができる。

【0010】この場合、1つの検知器でエレベータの位置を検知することができ、各商品棚にエレベータ検知器を設ける場合に比べて、構造が簡単で製作費を安くすることができる。

【0011】請求項3記載の発明は、請求項1または2記載の発明において、前記エレベータ内に商品受け板が上下動可能に配設され、該商品受け板が商品を受け取って下動されるのに連動して揺動する揺動部材が設けられ、該揺動部材の揺動を検知する商品検知用検知器が設けられていることを特徴としている。

【0012】上記構成において、所望の商品がエレベータ内に搬出されると、その商品が商品受け板に受け取られて、該商品受け板が下動され、それに連動する揺動部材の揺動を商品検知用検知器で検知することにより、商品がエレベータ内に搬出されたことを検知することができる。

【0013】この場合、エレベータがどの高さ位置に停止していても、1つの検知器で商品がエレベータ内に搬出されたことを検知することができ、構造が簡単で製作費を安くすることができる。

【0014】

【発明の実施の形態】以下、本発明の実施の形態を図面に基づいて説明する。図7は本発明の実施の一形態である横配列収納型自動販売機を示すものであって、販売機本体1内に、商品棚ユニット2が設けられると共に、該商品棚ユニット2内の前側空間3に商品搬出用エレベータ4が昇降可能に設けられている。なお、7は内扉8に開設した開閉扉9付き商品払出し口、10は外扉11に開設した開閉扉12付き商品取り出し口、14は庫外ユニットであって、コンプレッサー14aとコンデンサー14bとを有している。

【0015】前記商品棚ユニット2は、図7に示すように、販売機本体1の天井部に設けたガイドレール16に前後方向a、bに移動可能に吊持された枠体17と、該枠体17内に上下方向に沿って等間隔 $\alpha$ ごとに水平状態で配置された複数の商品棚18とを有しており、図7に仮想線で示すように、商品棚ユニット2を矢印a方向に引き出して、各商品棚18に商品Aを横配列状態で収納することができ、該各商品棚18は、横配列状態の商品Aを載せる商品載置台20と、該商品載置台20内に上下動可能に配置された従動コンベアー21とを有している。なお、各商品棚18間の間隔を商品Aの大きさに合わせて変更してもよい。

【0016】前記エレベータ4は、図1及び図2に示すように、前後壁部に入口30と出口31とを形成した矩

形箱体からなり、枠体17の天板部17a及び底板部17bにそれぞれ枢着した駆動スプロケットホイール(駆動回転体)25a及び従動スプロケットホイール(従動回転体)25bに巻回した駆動用チェン(索体)26に連結されており、ギヤードモータからなる昇降用駆動装置27により駆動スプロケットホイール25aを回転駆動することにより、前記エレベータ4を昇降させることができる。

【0017】前記駆動用チェン26には、図1～図3に示すように、各商品棚18の間隔 $\alpha$ に対応して複数の被検知部材32が設けられ、天板部17a上にチェン26に対向して被検知部材32を検知するマイクロスイッチからなるエレベータ位置検知用検知器33が設けられている。

【0018】上記構成において、チェン26を走行させてエレベータ4を昇降させ、これにより、チェン26に設けた複数の被検知部材32を検知器33で検知することにより、エレベータ4の位置を検知し、そのエレベータ4を所望の商品Aを載せた商品棚18に対向する位置に正確に停止させることができる。

【0019】この場合、1つの検知器33でエレベータ4の位置を検知することができるから、各商品棚18にエレベータ検知器を設ける場合に比べて、構造が簡単で製作費を安くすることができる。

【0020】図1及び図2に示すように、エレベータ4内の下部に商品受け板35が配設され、該商品受け板35は、その一端部に突設した支軸35aが出口31の近傍のエレベータ4の側壁に枢支されることにより、該支軸35aを中心上下動可能に構成され、その商品受け板35の他端部に突設した突起部35bがエレベータ4の側壁に形成した円弧状長孔36を貫通してエレベータ4の外に突出されている。

【0021】図3～図5に示すように、前記突起部35bに対応して揺動部材37とマイクロスイッチからなる商品検知用検知器38とが設けられている。前記揺動部材37は揺動ロッド37aと揺動アーム37bとを有し、該揺動ロッド37aは、前記突起部35bに当接され、その略L字状の下端部が底板部17bに枢支されることにより、該下端部を中心揺動可能に構成されている。前記揺動アーム37bは、天板部17aに揺動ロッド37aの下端部と同心状の支軸39を中心に揺動可能に枢支されると共に、その先端部が揺動ロッド37aの上端部に連結されている。前記検知器38は揺動アーム37bの基端部に対向して天板部17a上に固定されている。また、前記支軸39に揺動アーム37bを一方向に付勢するばね40が設けられ、そのばね40の付勢力により揺動ロッド37aが前記突起部35bに押し付けられて、前記商品受け板35を押し上げるようになっている。

【0022】上記構成において、所望の商品Aをエレベ

ータ4内に搬出していない状態では、商品受け板35が上動して傾斜状態で保持される(図1実線参照)と共に、揺動アーム37bの基端部が検知器38に当接されており(図5(b)参照)、この状態から所望の商品Aがエレベータ4内に搬出されると、その商品Aが商品受け板35上に載って受け取られ、これにより、該商品受け板35がばね40に抗して下動される(図1一点鎖線参照)と共に、突起部35b及び揺動ロッド37aを介して揺動アーム37bが揺動されて検知器38から離間され(図5(c)参照)、商品Aがエレベータ4内に搬出されたことを検知することができる。

【0023】この場合、エレベータ4がどの高さ位置に停止していても、1つの検知器38で商品Aがエレベータ4内に搬出されたことを検知することができ、構造が簡単で製作費を安くすることができる。

【0024】図1中、42は底板部17bに突設した商品払い出し枠であって、エレベータ4を最下降させることにより、該払い出し枠42の上端部をエレベータ4の底壁に貫設した貫通孔43を通って商品受け板35に当てるにより、該商品受け板35が押し上げられ、その商品受け板35上の商品Aをエレベータ4の外に払出すようになっている(図1二点鎖線参照)。

【0025】前記商品載置台20は、図1及び図4に示すように、略矩形箱状に形成されており、その上面20aに左右方向に沿って所定間隔をもいて複数の長孔45が平行に開設されている。

【0026】前記従動コンベアー21は、横断面略コ字状の支持枠46と、該支持枠46の前後両端部に回転可能に枢支された前後一対のブーリ47、48と、後側ブーリ48に接近して設けられた一対のガイドローラ49、50と、該両ガイドローラ49、50を介して前記両ブーリ47、48に前記各長孔45に対向して巻回された複数のベルト51とを有し、前記後側ブーリ48の支軸48aが商品載置台20に枢支されることにより、その支軸48aを中心に上下動可能に構成され、上動したときに、各ベルト51が長孔45を通って商品載置台20の上面20aよりも上方に突出して、商品載置台20の商品Aを受け取るように構成されている。

【0027】図1及び図6に示すように、各従動コンベアー21の後側ブーリ48の支軸48aにウォームホイール55が固定されると共に、該各ウォームホイール55に噛合するウォームギヤ56が連結ロッド57により一体連結され、該連結ロッド57の上端部が天板部17aに設けたギヤードモータからなるコンベアー駆動装置58の駆動軸に連結されており、コンベアー駆動装置58により連結ロッド57、ウォームギヤ56及びウォームホイール55を介して各従動コンベアー21を駆動することができる。

【0028】図4及び図6に示すように、各商品棚18とエレベータ4との間に、該エレベータ4に対向する従

動コンベアー21を上動させる上動操作手段60が設けられている。これは、各商品棚18の商品載置台20に突設した支軸61に中央部が揺動可能に枢支された揺動板62と、該揺動板62の上端に枢着されて従動コンベアー21の支持枠46に突設した係合片63に当接された上側ガイドローラ64と、揺動板の下端に枢着された下側ガイドローラ65と、該下側ガイドローラ65に対向してエレベータ4の側壁から後方に延びる突起部4aに固定した操作板66とからなり、その操作板66は上下方向に延びると共に、その上下端部66aがエレベータ4側に傾斜されている。

【0029】上記構成において、図6(a)に示すように、従動コンベアー21が下動して係合片63により上側ガイドレール64を介して揺動板62が押し下げられ、これにより、下側ガイドローラ65が前方に突出している状態で、エレベータ4を下降させると、同図(b)に示すように、操作板66により下側ガイドローラ65が後方に押し出され、これにより、揺動板62が上向きに回動されて、上側ガイドローラ64により係合片63を介して従動コンベアー21を上動させ、ベルト51を商品載置台20の上面20aよりも上方に突出させて、商品載置台20の商品Aを受け取るようになっている。

【0030】この場合、各商品棚18の従動コンベアー21が1つのコンベアー駆動装置58により駆動されるようになっており、該各商品棚18に従動コンベアー21を駆動するための駆動装置を設ける必要がないから、構造が簡単で小型化を図ることができると共に、製作費を安くすることができる。

【0031】なお、図1中、53は各商品棚18の前端に開閉可能に設けたゲートであって、このゲート45にロック機構(図示せず)を設けて商品Aの払い出し時にそのロックが解除されるようにするが好ましい。これによって、商品Aが商品棚18から不測に落下するのを防止することができる。

【0032】前記自動販売機はマイクロコンピュータからなる制御装置(図示せず)により制御されており、その制御装置の作用を説明すると、まず、商品Aを払出す前の状態では、図7に二点鎖線で示すように、エレベータ4が前側空間3の上部に待機しており、この状態で、自動販売機の前面に設けた押釦を押して所望の商品を指定すると、その指定信号に基づいて昇降用駆動装置27を駆動してエレベータ4を下降させ、チェン26に設けた複数の被検知部材32を検知器33で検知することにより、エレベータ4の位置を検知し、その検知信号に基づいてエレベータ4を所望の商品Aを載せた従動コンベアー21に対向する位置に停止させる(図7実線参照)。それと同時に、上動操作手段60により従動コンベアー21が上動されて、該従動コンベアー21を商品載置台20の上面20aよりも上方に突出させることに

より、商品載置台20上の商品Aが従動コンベアー21に受け取られ、その従動コンベアー21がコンベアー駆動装置58により駆動されて、該従動コンベアー21上の所望の商品Aがエレベータ4内に搬出され、商品受け板35上に商品Aが載せられる。これにより、商品受け板35が下動され、突起部35b及び搖動ロッド37aを介して搖動アーム37bが搖動されて検知器38から離間され〔図5(c)参照〕、商品Aがエレベータ4内に搬出されたことを検知し、その検知信号に基づいてコンベアー駆動装置58の駆動を停止すると共に、昇降用駆動装置27を駆動してエレベータ4を最下降させる。これにより、商品受け板35が払出し枠42の上端部に当たって押し上げられ(図1二点鎖線参照)、該商品受け板35上の商品Aが商品払出し口7を通って商品取り出し口10に払出される。

【0033】この場合、エレベータ4を下降させて所望の商品Aを払出すようになっており、従来のように、商品Aを商品棚18から落下させないから、その払出しの際に騒音が発生せず、商品Aが変形したり損傷されたりすることもない。

【0034】なお、上記構成では、エレベータ4を昇降させるために、駆動用チェン26を用いたが、それに代えてワイヤーを用いてもよい。

【0035】

【発明の効果】請求項1記載の発明によれば、販売機本体内の適所に各商品棚の従動コンベアーを駆動するコンベアー駆動装置が設けられており、各商品棚に従動コンベアーを駆動するための駆動装置を設ける必要がないから、構造が簡単で小型化を図ることができると共に、製作費を安くすることができる。また、従動コンベアー上の所望の商品をエレベータに移し換えた後、該エレベータを下降させて所望の商品を払出すようになっているから、その払出しの際に騒音が発生せず、商品が変形したり損傷されたりすることもない。

【0036】請求項2記載の発明によれば、1つの検知器でエレベータの位置を検知することができ、各商品棚

にエレベータ検知器を設ける場合に比べて、構造が簡単で製作費を安くすることができる。

【0037】請求項3記載の発明によれば、エレベータがどの高さ位置に停止していても、1つの検知器で商品がエレベータ内に搬出されたことを検知することができ、構造が簡単で製作費を安くすることができる。

### 【図面の簡単な説明】

【図1】本発明の実施の一形態である横配列収納型自動販売機の要部の縦断面図である。

【図2】図1のA-A矢視図である。

【図3】同平面図である。

【図4】同水平断面図である。

【図5】(a)は図1のB-B矢視図、(b)は同要部の作動前の平面図、(c)は同要部の作動後の平面図である。

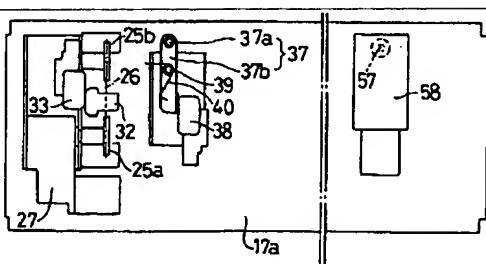
【図6】(a)及び(b)は従動コンベアーを上動させる手順を示す要部の正面図である。

【図7】同自動販売機全体の縦断面図である。

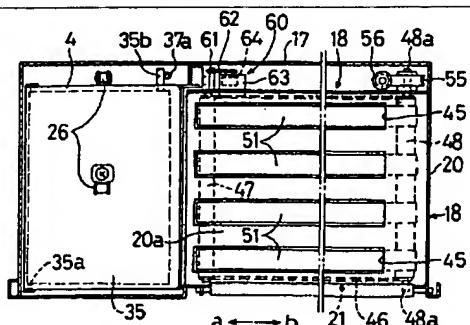
### 【符号の説明】

1	販売機本体
4	商品搬出用エレベータ
18	商品棚
20	商品載置台
21	従動コンベー
25a	駆動スプロケットホイール（駆動回転体）
25b	従動スプロケットホイール（従動回転体）
26	駆動用チェン（駆動用索体）
32	被検知部材
33	エレベータ位置検知用検知器
35	商品受け板
37	揺動部材
38	商品検知用検知器
58	コンベー駆動装置
60	上動操作手段
A	商品

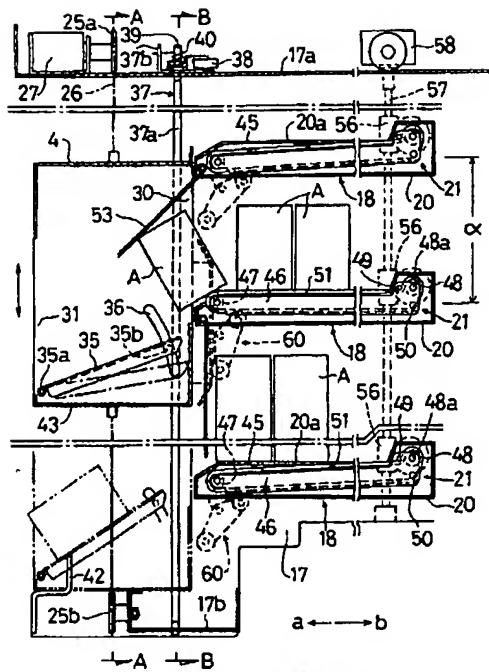
【図3】



[図4]

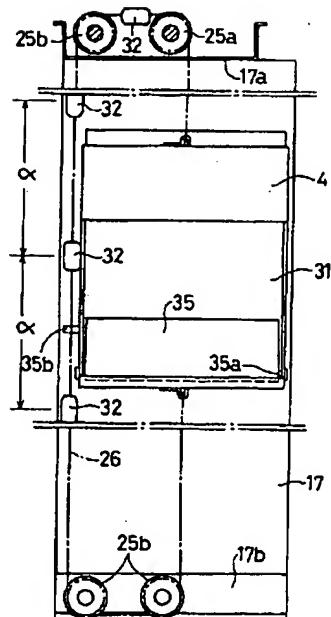


【図1】

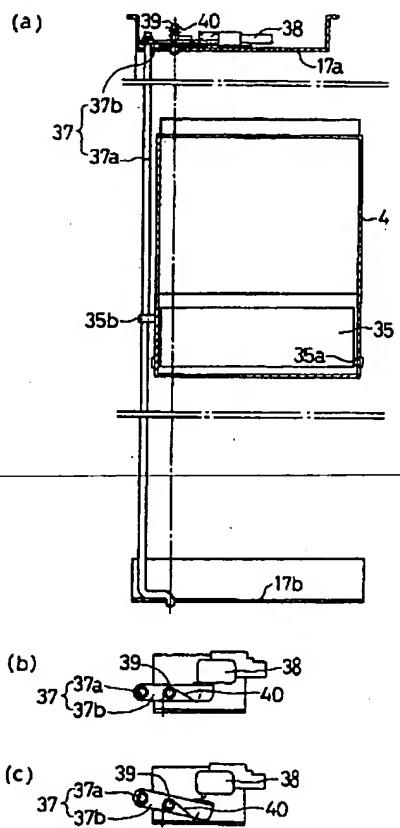


1 販売機本体  
4 商品搬出用エレベータ  
18 商品棚  
20 商品載置台  
21 従動コンベア  
35 商品受け板  
58 コンベア駆動装置  
60 上部操作手段  
A 商品

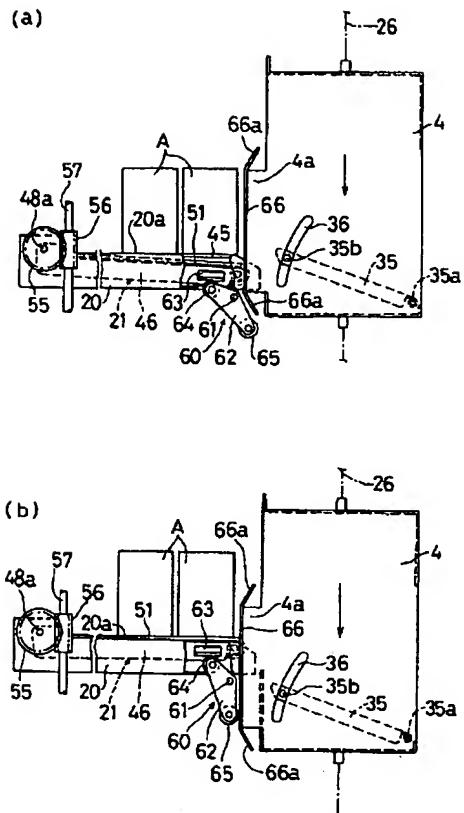
【図2】



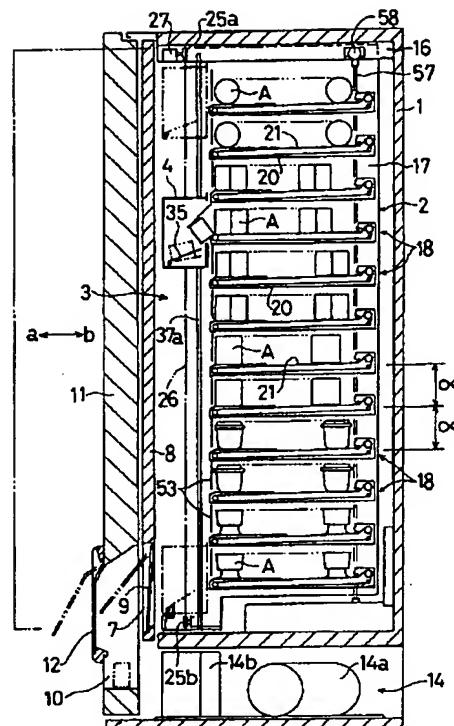
【図5】



【図6】



【図7】



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